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Cost Reduction Through Cost Controls for Post-War Operation, by Howard A. Giddings..... 1127

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EDITORIAL DEPARTMENT NOTE

A tremendous task faces industry in the post-war period in re-establishing and improving the cost-control techniques which were relaxed or abandoned in the effort to achieve all-out production for war under conditions of rapid change and inadequate personnel. War production goals have been met, and we are now facing the transition and post-war period. In the transition period, problems of termination and reconversion will occupy much of the time of those best qualified to plan and direct the return to more economical production, but time must be found for this phase of the work if the end of the transition period is to find industry in a position to contribute most to a healthy post-war economy. The article in this issue of the *Bulletin* presents a common-sense and forward-looking approach to this problem of reestablishing cost control.

The author of this article, Howard A. Giddings, graduated from New York University in 1921 with the Bachelor of Science degree, majoring in Accounting and specializing in cost accounting and then took post-graduate work in factory organization and management. His early experience, gained during vacations between college years, and before and after World War I, was in manufacturing with the Eastman Kodak Co. and in engineering and cost reduction work with the General Electric Co. Subsequently, he worked three years for the Yale & Towne Manufacturing Co. as Assistant Supervisor of Office Methods, and, in 1926-1927, on the Cost System Staff of Peat, Marwick, Mitchell & Co. Since that time, his experience has been principally in public accounting, but he was associated for a time with several Virginia manufacturers. He is now Manager of the Systems Department of Leach, Calkins & Scott of Richmond, Virginia. Mr. Giddings has been active in N. A. C. A. for several years, both as a chapter speaker and as an officer of the Richmond Chapter. He served as President of the Richmond Chapter during 1942-1943.

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COST REDUCTION THROUGH COST CONTROLS FOR POST-WAR OPERATION

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WHAT will be the industrial situation in the post-war period? I do not think that anyone really knows, but, it seems to be generally believed that during the early part of the post-war period, at least, costs will be high. Presumably, material costs will still be considerably above normal; labor groups will be insistent to maintain high wage levels; taxes are bound to be very high even if federal, state, and local governments make Herculean efforts to practice the utmost economy. Beyond that, we can only conjecture as to what the industrial situation will be, but, there *is* a point, however, which I believe is certain, and it is this—very, very shortly in the post-war period, *costs must be reduced.*

Why Is Cost Reduction Necessary?

Let us start off by considering what the function of industry is. Is it not to serve the public and make a profit in so doing, if it can? Any other viewpoint seems to invite some form of complete government control with government-established ceilings on everything made, from pins to the houses in which we live, together with government-furnished subsidies to the manufacturer or contractor, that is, furnished as long as funds may be available to furnish. Then, we would wake up and start over on the fundamental premise first mentioned—to serve the public and make a profit in so doing, if we can. Whether we make that profit or not also depends upon a fundamental—that we produce our product or service at a cost something under what we get for it. So, that matter of cost seems to be ever with us, and to require control, if we are to be assured of a profit.

Two achievements seem to me to stand out very sharply in the history of industrial America. The first is the mastery of the techniques of mass production. In no other country have these been so highly developed. The second, closely allied with the first, is the mastery of cost control. This, also, has been more highly developed here than in any other place on the globe. These two achievements have given us a standard of living far surpassing

anything the world has ever known. Mastery of the techniques of cost control is probably responsible for production at relative values that permit the wide spread of sales which makes mass production possible.

The Present Situation

Now, what is the present situation? Costs are inflated; many expenses, actually unnecessary for production, construction, or transportation are incurred for various reasons. Some are dictated by government, some are dictated by expediency in dealing with government, and some have just slipped in. There are some shining examples of efficient operation, but, there is also inefficient operation in many directions. Present high volume is due to war demands and is not based upon production at relative values that can sustain mass production. There is mal-adjustment of the cost burden; some are fortunately able to recover their present costs; some are not. This general situation is not entirely a problem incident to the war. It has been aggravated by the war, but the basic difficulties have been growing for some years. This was recognized in the summer of 1938, when the N. A. C. A. devoted its entire annual cost conference to various phases of the theme, "Control of Industrial Costs." The Chairman of those sessions, Mr. A. B. Gunnarson, in opening the conference, commented upon the widespread rise in costs and pointed out that we now have in addition "a great multitude of laws designed to place greater restrictions on the operation of private business enterprise. Before many of these restrictions and inflexibilities were introduced into the business structure, the leeway between costs and selling prices allowed for some carelessness, for some waste, or for some dipping into profits. There was sufficient flexibility to warrant only incidental attention to methods for controlling costs and inefficiencies. Introduction of inflexible elements has reduced the play between the various elements. There is need for closer supervision by management over every element of cost. Use of the most efficient equipment and methods is essential. Cost records must reflect every variation which threatens to encroach upon the narrow margins available to business. Eternal watchfulness is the price to be paid for business existence." If that was true in the summer of 1938, it is doubly true now.

High Costs and the Standard of Living

Why is cost reduction necessary? Because present high costs, or costs approaching these levels, are insupportable to our national economy, we cannot, under wastefully high costs, produce and sell to maintain a high standard of living. Waste and other unnecessary expense, besides increasing costs and being unproductive, reduces the opportunity to buy of that large part of our population which has only the income of its labor or service. This point can be illustrated by a simple example. Suppose A makes shoes and B makes bread, and that each makes the same wages. B buys shoes made by A, and A buys bread made by B. If unnecessary expense is injected into the cost of making shoes and the selling price is raised accordingly, B's wages will buy less shoes and his standard of living is lowered. Also, if unnecessary expense is added to the cost of baking bread, A's wages not increasing, A will be forced to buy either less bread or less of some other item he and his family need, thus reducing their standard of living.

The foregoing simple illustration indicates a small curtail in buying power for A and B. Multiply that by thirty million wage earners, and it is readily seen how there is started a vicious cycle of reduced buying which, like a snowball rolling down hill, gets larger and larger as it continues, until we have a major depression with widespread unemployment. Under present wastefully high costs, we cannot maintain a high standard of living and, more serious, we have the basic element for a post-war depression of considerable magnitude and of profound consequences. I do not wish to be a dispenser of gloom; rather, I have an abiding faith that industry will correct the present situation, institute effective economies, and set the pace for an even higher standard of living.

Again, why is cost reduction necessary? Because natural competition in spite of any governmental controls that may be established will break companies with excessive costs. Some concerns in each line of industry are certain to seek more efficient and economical methods; the others must follow or be forced out. It is entirely wholesome and will help to safeguard our standard of living for business concerns to seek more efficient and economical methods, but it will be tough on the ones that do not. Natural laws cannot be suspended indefinitely; customers will not pay excessive prices any longer than they are obliged to do so.

Where Are the Excessive Costs?

Wherein do these excessive costs lie? They lie in the very elements of cost—material, labor, and overhead.

Material—As to material, they lie in the use of excessively costly items, when less costly materials of equal or greater utility would serve as well or better. They lie in inefficient purchasing and in inadequate storage permitting theft of or damage to materials; they lie in wasteful use of materials due to careless or unskillful lay-out of patterns, templates, etc.

Labor—As to labor, the post-war wage level is unknown but, very likely, it will be high. However, there are inefficiencies and wasted effort that we can and must consider. You are probably aware of some in your own business. Any one who goes into various businesses knows that present labor efficiency in many industries is too low with the Government paying the bill. What are some of these wastes? Poor planning and scheduling of work plus lax and untrained supervision are the chief causes. Excessive spoilage not only wastes materials but wastes labor time. An additional factor we shall have to deal with in the post-war period will be that of unfavorable tendencies arising out of habits developed in army and navy life. I know, for I returned from the last war directly to a manufacturing plant. As to post-war labor rates, I wish to make clear that I have no quarrel with high rates. I believe in high labor rates, but *what is obtained for such rates* seems to me to be the point. Is it not reasonable to expect efficient performance for time well paid for? Efficient performance must be considered as an essential requirement in reducing costs and in protecting the American standard of living.

Overhead—Overhead, that element of cost in addition to direct material and direct labor, is a fertile field for the attention of management and of the cost accountant. It is of three kinds pertaining to the fields of operation—manufacturing, selling, and administrative.

Manufacturing overhead comprises indirect and service labor, supplies of many kinds including fuels, and indirect expenses such as depreciation, insurance, taxes, repairs, etc., applicable to manufacturing operations. Some of these are directly controllable by

close supervision. Contrary to frequently expressed ideas, I believe all of the others are partially controllable. You may agree with this point or you may consider it an erroneous statement. But, consider it carefully. Take the item of taxes, for example. It is an item which many people would say is absolutely uncontrollable. We have in our state, as in all others, many taxes, and one is a state tax on certain items of "Capital." The tax rate is seventy-five cents per hundred dollars, levied upon four specific groups of property including cash. A certain concern had made a substantial profit but having no cost system had no idea how much until after the close of the year and bought only a small amount of tax certificates up to December 31, although it had a very large cash balance. Tax certificates are not taxable in this state, but money is, and this slip cost the concern in question about eight hundred dollars. Take the other items of manufacturing overhead, consider them carefully, and I think you will agree that each of them is at least partially controllable.

As to selling overhead or selling expense, there is, of course, very little resemblance beween present and post-war conditions, but it is likely that many concerns will approach post-war selling as they approached pre-war selling, and there is much in the attitude toward pre-war selling to think over. "Bear down on the factory, but nothing is too good for the sales department" has been a policy in many concerns that have prided themselves on their efficiency and low manufacturing costs. That this policy has wrecked many business concerns can be demonstrated by reference to the records of business mortality, but a local situation, without names, will serve as an illustration. About nine years ago the manufacturer of a limited line of food products with several small but successful plants opened a plant here. The products were good and the local operations were successful, volume increasing each year through gradual but steady expansion. Then the company embarked upon a very large sales expansion program. Many new salesmen were employed and assigned territories far from the plants and in sections where the products were unknown. Large sums were spent on advertising to break down sales resistance; traveling and other items of selling expense were allowed to increase with little or no restraint. Sales volume was increasing only very slowly in the distant territories, and the ratio of selling

expense to total sales volume mounted rapidly, increasing from 18 cents of the sales dollar at the start of the program to 51 cents of the sales dollar within a few months. Finally, the company attempted to break into a territory in northern Pennsylvania where a very large and nationally known manufacturer was well established. The small company's finances could not stand the strain of uncontrolled selling expenses and, in spite of good products and efficient manufacturing, it went into bankruptcy, and its plants were sold.

As to administrative overhead, many of the same factors of excessive cost inherent in selling expense, and some others, are found here also.

What Steps Are Necessary?

Having considered the need for cost reduction and some of the places wherein excessive costs lie what are we going to do about it? What can be done to reduce these excessive costs?

First, we must know the facts. We must determine definitely and with reasonable accuracy what we are doing in total, by divisions and, in many cases, by sub-divisions of the business, and by the various factors which influence the profit or loss. Therefore, accounting controls must be set up to show:

1. What the *present* costs are by natural and logical divisions of the business, and *where* each cost occurs.
2. What progress is made by specific steps to reduce cost, some of which are outlined below.

If cost controls are necessary to indicate where special attention is needed, and to guide and evaluate the savings from specific steps taken, what type of cost controls are best suited? That depends upon the nature of the business and the attitude of the management, but, in general, I believe it is best to start with some type of simple controls on an actual basis. Refinements and expansion of these controls can later follow upon the experience gained with a simple type of controls and be more satisfactory at less cost.

Second, we should take definite steps to reduce cost through improvement of operations and elimination of waste.

Reduction of Material Costs

As to materials, the purchase cost may not be readily reducible during the early part of the post-war period since it is composed largely of the labor and expense cost of preceding processors, but there are other factors of material cost to which attention can be directed profitably without delay:

1. Substitution of other materials less costly but of equal or greater utility. In some cases, this may involve laboratory or other technical research but such technical expense, if properly controlled, may result in substantial net savings.
2. More efficient purchasing, storing, and internal plant transportation of materials being processed.
3. More effective use of material and less waste. Examples in several industries follow:
   a. In furniture and other woodworking plants, there should be definite specifications as to proper lengths, widths, and thicknesses of lumber to be drawn from the piles so that minimum cutting waste will occur from the rip-saw operation to completion. Proper kiln-drying to avoid "checking" at ends of boards, and proper adjustment of planers, shapers, and other equipment will help further.
   b. In metal working industries, proper use of patterns and templates to avoid cutting waste in use of sheet metals; use of proper size bar and rod stock to avoid excessive waste on lathe operations, etc.
   c. In garment industries, the careful use of correct cutting patterns to avoid cutting waste. Recently I was in a factory making various kinds of uniforms (non-military), and observed some very efficient lay-out work. When the cutter had run out the cloth to 288 thicknesses for two gross of garments, the pattern was laid out upon the top layer of cloth, was traced on this top layer, and the cutter proceeded to cut. So efficient had been the work of the pattern designer in providing, in the one pattern, the main garment, straps, belt, etc., and so accurate the work of the cutter, that, when completely cut, not even a piece,

one inch square, was left over, and the pattern was approximately ten feet long by three feet wide.

d. In paper manufacturing, careful attention to obtain maximum yield of pulp through efficient chipping and cooking, and through recovery of pulp remaining in water passing the screens of the paper machine. It is not uncommon among a group of half a dozen paper manufacturers to find a difference of 20 per cent in yield factor between the most efficient operator and the least efficient. With an average size mill, such as we have in Virginia, this difference can represent an annual loss to the inefficient operator of over two hundred thousand dollars. While dealing with the illustration of paper manufacture, let me mention possible savings incident to factors other than direct material. What, in the paper industry, is termed "broke" (scrapped paper due to trimming waste, spoiled paper at the rewinder, etc.) can easily vary from 3 to 7 per cent of total production. While the "broke" goes back to the beaters and is re-fed to the paper machine and is thus recovered so far as material is concerned, the labor and manufacturing overhead thereon has been lost. A four-per cent wastage of these elements is not pennies; it amounts to several thousand dollars a month. Also, recovery of lime, salt cake, and other chemicals used to convert the pulpwood into pulp is a matter of major importance. These chemicals are required in large quantity, are a costly item in the process, and the unnecessary loss in recovery of these chemicals in a moderate size plant may readily run into the tens of thousands of dollars monthly.

Many more illustrations might be given as to possible savings in materials, but these will suffice.

Accounting Controls

Before passing on to possible specific savings in other elements of cost, let us pause here and consider the cost controls from an accounting standpoint, and ask what part they are playing in our effort to get our costs under control. I am not referring to places where effective cost controls are in operation, but to places where

there have been no cost controls, or where those once existing have through inattention or preoccupation with other matters become obsolete and ineffective.

As with a pair of shoes or a suit of clothes, the cost controls must fit the user; otherwise they are not very useful and, in the case of cost controls, cannot be effective. But, they do not have to be elaborate to be effective; in fact, the simpler, more likely the better. I have previously advocated starting with a simple type of cost controls on an actual basis. Predetermined standards and other refinements have their places in certain types of business, *after* and, I firmly believe, not before, reliable data are obtained on an actual basis.

Accordingly, accounts will be set up and reporting procedure provided for accumulating actual costs of direct material, direct labor, and the necessary analysis of manufacturing overhead by departments, sub-departments, or by whatever divisions of the particular business are indicated as the logical points around which to accumulate cost. In most cases, quantities of materials and principal supplies used will be reported at principal stages of manufacture and the data accumulated for comparison with weight of product produced. Careful consideration of this latter information will often point out the locations of unnecessary material losses. The cost and quantitative data can be accumulated by the week, month, 28-day period, or by whatever period is indicated as being the desirable one in the particular business.

Accounts and reporting steps will be provided also for recording sales and selling expenses by whatever divisions are indicated as logical and effective in the particular case. This might, in some businesses, be by product lines, whereas, in others it might be by sales channels, territories, salesmen, or by a combination of several divisions. These breakdowns of manufacturing and selling costs must be worked out by the cost accountant to fit the real needs of his own business. In all cases—and this is of primary importance—these controls and the supporting analyses should be broken down to the point where they will truly point out all essential facts as to what is being done and, at the same time, avoid any unnecessary steps. This is where the cost accountant's judgment and skill first come into play. Thus, actual costs of what is being done, at the start and as the specific cost reduction steps are

progressing, will be determined and will indicate, by week, month, or 28-day period, the progress made.

If the controls are set up properly and the reporting steps established and followed up properly, very likely you will receive some information that may amaze you, and again, at the start, it may not. It is possible to become callous to waste. But, amazed or calloused, start out to see what can be done in some cost reduction steps. There are certainly *some* points at which any of us can reduce costs.

Space does not permit elaborating upon the means used by the cost accountant to apply the information brought to light through the cost controls and their analyses. Let it suffice to say that tact is very important, as the cost controls may disclose information that may be embarrassing temporarily to some, but will be vitally important to all. Instead of considering the disclosures as embarrassing, let the cost accountant take the viewpoint that each member of the organization is working to get at the root of whatever is inefficient, and that findings as to what is wrong are in reality valuable nuggets of information that a superintendent, foreman, shift boss, or any other employee can use to do his job better and make himself more valuable.

Reduction of Labor Costs

May I repeat that I believe in high labor rates, but the time paid for should in many cases be more productive. Unquestionably, in many plants, the workers themselves are partly responsible for inefficiencies. I am going to leave this problem to your own disposition, as the desirable type of worker generally responds to leadership and instruction in more efficient methods. Let us consider here some steps of a different nature:

1. Planning and scheduling of work in advance for steady operation is a matter that deserves more attention than is often given to it, and will help considerably to reduce idle time.
2. Better supervision all down the line—general superintendent over department heads; department heads over foremen and shift bosses; foremen and shift bosses over individual workers; and thoughtful direction by management to encourage more intelligent, more technically informed, and more cost-

conscious supervision will be found to increase labor efficiency.

3. Technical improvements through joint efforts of engineers, methods and time study men, and superintendents and foremen can be effective in increasing production by:

   a. Development of additional tools and jigs which permit workmen to increase their output. I was in a machine shop recently where the plant superintendent and machine shop foreman had in three years more than doubled the *over-all* production by the use of home-made and inexpensive jigs; on certain items the increase per man hour was much higher.

   b. Studying the difficulties and bottlenecks to production—wherever they may be—and ironing them out. Here, also, help and encouragement by management are important.

4. Lay-out equipment for straight-line operation just as fully as possible to avoid unnecessary labor due to back tracking within departments, between buildings, and between plants in other cities. This is very important and, in post-war operation, I believe we shall see some remarkable improvements in this respect. Several of the largest concerns have already planned their operations and the relocation of all equipment for peacetime straight-line operation. Back tracking between plants in other cities involves, of course, more than labor.

Reduction of Manufacturing Overhead

Due to the mechanization of industry, manufacturing overhead is necessarily high, and will be higher. However, it contains waste that can be eliminated, and this portion frequently represents a considerable part of cost. Avoidable waste in manufacturing expense items seems particularly needless for it helps no one; savings in this direction, if reasonably handled, do not upset labor and may readily amount to many thousands of dollars; also they bring additional benefits through making the entire organization more cost conscious. The matter of reduction in the cost of manufacturing overhead is frequently treated with disdain in the thought that possible savings therefrom would be small. This is an errone-

ous idea. Savings in the improved use of fuels, supplies, and the many expense items that go to make up controllable manufacturing overhead are considerable. For example:

1. *Water*—Metered city water for industrial use may be expensive. In a large plant it may easily run to $40,000 per year, or more. With some study of the problem, it can often be arranged to use lake, river, or well water for cooling and other process use, for boiler feed water, for flushing purposes, etc.

2. *Steam*—Uncovered steam mains lose a great many heat units; they, together with faulty joints in the mains and distribution pipes, and defective valves and steam traps can increase the fuel bill considerably.

3. *Compressed Air*—This may seem like a small item, but it is not. Walk through the factory when it is not working and listen for compressed air escaping from defective couplings, valves, hose, and hoists. Not only repairs to faulty equipment but change from handle type to spring shut off valves may be necessary—where the equipment permits—in order to avoid loss due to carelessness in not shutting off the air valves.

4. *Electricity*—Savings in electricity do not mean penny pinching on necessary lights but vigilance against lights burning and motors running unnecessarily, defective motors and connections, dirty lamps, fixtures, and walls which steal light, and, very important, the selection of efficient electrical equipment.

5. *Fuel Oil*—In operating fuel oil furnaces for foundry work, annealing ovens, etc., efficient operation depends to a large extent upon the proper mixture of oil and air. If these furnaces are not equipped with modern, improved mixture burners, a large waste of oil may result from careless adjustment of oil and air valves by inexperienced or careless workmen. Some concerns with old-style equipment control the oil by inserting into the union in the oil feed line to each furnace a brass disc drilled with a small hole large enough to allow the proper amount of oil under pressure to pass

through. Savings of 30 to 35 per cent of the oil previously consumed are usual from this step.

6. *Gas*—Are the furnace walls and doors well insulated, do the doors fit tightly, and are they kept shut except for loading and unloading? The heat within the furnaces may be accurately controlled by very fine pyrometric instruments because the process requires it, and at the same time from 10 to 30 per cent (and sometimes more) of the gas bill may represent waste due to poor construction, lack of proper maintenance, and carless loading and unloading.

Many other examples might be cited, but the foregoing will illustrate the direction of efforts to control manufacturing expense—systematic inspection and prompt adjustment or repair of equipment, vigilance on the parts of the factory management and cost accountant, and the fostering and deliberate development by management of a cost-conscious attitude throughout the entire organization.

Conclusion

If business concerns are to get their houses in order for post-war operation, if they are to take specific steps to eliminate waste and inefficient operation, who is to direct these efforts? Obviously, management itself must be the main-spring to see that adequate steps are taken, but management must have help in carrying out its determination to control costs. Control of costs, like design of product, is a technical task. Who, better than the cost accountant, is trained for this task? Assuming that he is alert, observing, and well acquainted with the business operations, he is the man to assist management in actually bringing the costs into line. With proper controls set up to furnish information as to what costs are, and where they occur, he is able to point out the danger spots and the points of possible savings. In case changes in structures, equipment, or methods are being considered, he is in a position to analyze and compare the probable savings in operation against the cost of making such improvements.

One puzzling thought, one question as to the future, may be uppermost in your mind. When the post-war period arrives, will governmental controls permit businesses to practice economies, or

will much restricted operations under governmental control place burdens inimical to plans for efficient and economical operation? That, members of management and cost accountants, is up to you —to reassert your leadership in formulating our economic thought. I am confident that this leadership will be reasserted, and that business again can make its plans to operate as efficient business units, continually making improvements in operations and reducing the cost per article to provide a still higher, rather than lower, standard of living. To make this possible, cost control will point the way and will guide its effective accomplishment.